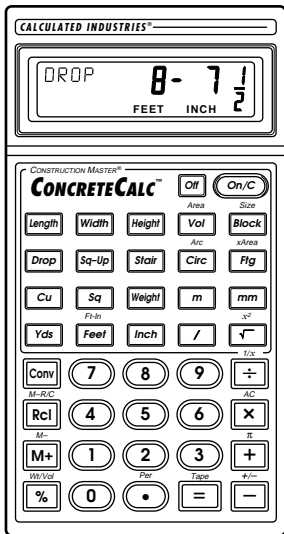


# CONCRETECALC™

For Today's Concrete Professional



## User's Guide



**CALCULATED  
INDUSTRIES®**

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# INTRODUCING CONCRETECALC™

Designed for today's concrete professional, the all-new *ConcreteCalc*™ adds even more power to the already powerful *Construction Master* line-up. Like earlier models, this calculator is so simple to use, even the novice user can easily solve dimension-related problems. Features include:

- ◆ Solve Dimensional Math with Ease
- ◆ Instant Dimensional Conversions
- ◆ English/Metric Conversions
- ◆ Weight/Volume Conversions
- ◆ Rectangular Area/Volume Calculations
- ◆ Instant Block Quantity Solutions
- ◆ Instant Footing Volume Calculations
- ◆ Instant Square-Up (Diagonal) Solutions
- ◆ Drop Distance Calculations
- ◆ Instant Circular Area and Perimeter
- ◆ Instant Arc Length Calculations
- ◆ Calculate Stair Risers and Treads
- ◆ Material Estimations
- ◆ Paperless Tape

# KEY DEFINITIONS

## ***Basic Functions***

---

**[+] [-] [x] [÷] [=]**

*Arithmetic Operation Keys* — Used to perform arithmetic functions.

**[%]**

*Percent* — Four-function percent key.

**[0] – [9] and [ • ]**

*Numeric Keys* — Used to key numeric values.

**[Off]**

*Power Off* — Turns all power off. Resets the display and all non-permanent registers.

**[On/C]**

*Power On/Clear* — Turns on power. Pressing once clears the last entry and the display. Pressing twice in succession clears all temporary registers.

**[Conv]**

*Convert* — Used with the dimensional keys to convert between dimensions. Dimensions can only be converted within the same convention (i.e., linear, square or cubic). Also used to access special functions when used in combination with other keys as defined herein.

[√]

*Square Root* — Used to find the square root of a number. **Note:** Attempts to find the square root of a linear or volume dimension will cause an “Error”.

[Conv] [√]

$x^2$  — Finds the square of the displayed value. **Note:** Attempts to find the square of an area or volume dimension will cause an “Error”.

[M+]

*Memory Add* — Adds the displayed number to the value stored within the semi-permanent Memory.

[Conv] [M+]

*Memory Minus* — Subtracts the displayed value from Memory.

[Rcl]

*Recall* — Recalls values stored in any register. [Rcl] [M+] displays the value in Memory.

[Rcl] [Rcl]

*Memory Display/Clear* — Displays the value in Memory and clears the register.

[Conv] [Rcl]

*Memory Clear* — Clears the Memory without changing the current display.

## ***Dimension Keys***

---

### **[Yds]**

*Yards* — This is an entry and conversion key. The entry can be a whole number or a decimal number. Used with the **[Conv]** key converts any other displayed dimensioned number to yards.

### **[Feet]**

This is an entry and conversion key. The entry can be a whole number or decimal number. This key can also be used in conjunction with the **[Inch]** and **[/]** keys for entering values in Feet-Inch format. For example, *6 feet 9-1/2 inches* is entered as follows:

**6 [Feet] 9 [Inch] 1 [/] 2**

Repeated presses of this key during conversions will toggle between Feet-Inch and Decimal Feet formats.

### **[Inch]**

This is an entry and conversion key. The entry can be in whole or decimal numbers. This key can also be used in conjunction with the **[/]** key for entering values in Fractional Inch format. Repeated presses of this key during conversions will toggle between Fractional Inch and Decimal Inch formats.

## [/]

*Fraction Bar* — This key is used to enter fractions. Fractions can be entered as proper (1 or less —  $1/2$ ,  $1/8$ ,  $1/16$ ) or improper (greater than 1 —  $3/2$ ,  $65/64$ ). For example, to enter  $1/2$ , the key sequence would be: 1 [/] 2. If the denominator (the bottom number) is not entered, then the set fractional level ( $1/16$ ,  $1/2$ , etc.) is used. [Rcl] [/] displays the current fractional setting.

## [Cu]

*Cubic* — This key is used with a dimension key (feet, inches, yards, meters, etc.) to identify a value as being a volume. Example: 5 [Cu] [Yds].

## [Sq]

*Square* — This key is used with a dimension key (feet, inches, yards, meters, etc.) to identify a value as being an area. Example: 10 [Sq] [Feet].

## [m]

*Meters* — This is an entry and conversion key used to enter decimal meters or to convert decimal meters from some other dimensional format (when used in conjunction with the [Conv] key).

## **[mm]**

*Millimeters* — This is an entry and conversion key used to enter or to convert to decimal millimeters (when used in conjunction with the **[Conv]** key).

## **[Weight]**

This key is used to convert a dimensioned cubic value or volume, to a weight value using the **[Conv]** key and the stored Weight per Volume (see below). For example, **5 [Cu] [Yds] [Conv] [Weight]** equals *7.5 tons*, or **10 [Weight] (tons) [Conv] [Cu] [Yds]** equals *6.666667 cubic yards*. Repeated presses of this key, after a cubic entry or conversion, will toggle between tons, pounds and kilograms.

## **[Conv] [%]**

*Weight per Volume* — Used to set the Weight per Volume. Can be programmed as Tons per Cubic Yard, Pounds per Cubic Yard, or Kilograms per Cubic Meter. Default is 1.5 Tons/Cu. Yd. To set a different weight per volume, for example, *2 Tons/Cu. Yd*, press **2 [Conv] [%]**. Value will be permanently stored. To recall stored value, press **[Rcl] [%]**.



## **Area/Volume Keys**

---

### **[Length]**

Enters the value for Length in dimension problems (e.g., for calculating area or volume). **Note:** *This key is also used to enter the length for "Square-ups" and the "Run" for stair problems.*

### **[Width]**

Enters the value for Width in dimension problems (e.g., calculating area or volume). **Note:** *This key is also used to enter the width for "Square-ups."*

### **[Height]**

Enters the value for Height in dimension problems (e.g., for calculating volume). **Note:** *This key is also used to enter the "Rise" for stair problems.*

### **[Vol]**

*Volume* — Computes the volume (Length x Width x Height) in Cubic Yards based on entered Length, Width and Height values. A second press will display the area (in square feet) based on entered Length and Width. Successive presses will toggle the display between the calculated area and volume.

### **[Conv] [Vol]**

*Area* — Computes the area in Square Feet based on entered Length and Width.

## **Square-Up & Drop Keys**

### **[Sq-Up]**

*Square-up* — Enters or computes the “Square-Up” (or Diagonal) length based on entered Length and Width values.

### **[Drop]**

Computes the total drop (or fall) over an entered Length, given an entered percentage drop or inch drop per foot value. Successive presses will act as a “constant add,” for displaying successive drops.

## **Block/Footing Keys**

### **[Block]**

*Number of Blocks* — Computes the number of blocks or bricks needed after entering a wall area, or values entered in Length and Height.

### **[Conv] [Block]**

*Block Size* — Used to permanently set the size of a single block or brick. The default size is 128 square inches for an 8” x 16” block. To recall the stored block area, press [Rcl] [Block].

### **[Ftg]**

*Footing* — Used to compute concrete volume of footings, walls, curbs, etc.

given an entered cross-sectional footing area (see [Conv] [Ftg]) and Length.

### **[Conv] [Ftg]**

*Cross-sectional Area* — Used to permanently set the cross-sectional area for calculating footings. The default setting for the cross-sectional area is 1.8 square feet. To recall the stored cross-sectional area, press [Rcl] [Ftg].

## ***Stair & Circle Keys***

---

### **[Stair]**

A multi-function key that displays the following values when pressed repeatedly (using Length and Height values):

<b>#</b>	<b>Presses</b>	<b>Information Displayed</b>
1		Number of Risers
2		Riser Height
3		Riser Overage/Underage
4		Number of Treads
5		Actual Tread Width
6		Tread Overage/Underage
7		Stringer Length
8		Inclination Angle

When the [Stair] key is preceded by a linear or undimensioned entry, the value will be permanently stored as the

“Desired Riser Height”. Undimensioned values are assumed to be inches.

### **[Circ]**

*Circle* — Based on an entered diameter, repeated presses display the following circular values: 1) diameter, 2) area 3) circumference.

### **[Conv] [Circ]**

*Arc Length* — Used to find the arc length based on an entered diameter and angle. For example: 1 [Inch] [Circ] 180 [Conv] [Circ] would display an Arc length of  $1\frac{9}{16}$  inches for an entered diameter of 1 inch and a  $180^\circ$  angle.

## **Fractional Rounding Settings**

### **[Conv] 1**

Fraction set to  $1/\underline{16}$

### **[Conv] 2**

Fraction set to  $1/\underline{2}$

### **[Conv] 3**

Fraction set to  $1/\underline{32}$

### **[Conv] 4**

Fraction set to  $1/\underline{4}$

### **[Conv] 6**

Fraction set to  $1/\underline{64}$

### **[Conv] 8**

Fraction set to  $1/\underline{8}$

### **[Conv] 7**

Fraction set to “*Normal Mode*” (reduces to the lowest common denominator).

### **[Conv] 9**

Fraction set to “*Fixed Mode*” (denominator value always fixed or remains the same as fractional setting).

### **[Conv] [ / ]**

Toggles the flashing fraction feature on/off. The flashing denominator reflects the current fractional setting.

## ***Additional Functions***

---

### **[Rcl] [ = ]**

*Paperless Tape* — Accesses the paperless tape mode.

### **[Conv] [ ÷ ]**

*Reciprocal* —  $1/x$  function.

### **[Conv] [ x ]**

*All-Clear* — Clears all values including Memory. Resets all permanent registers to default settings (weight per volume, block area, footing cross-sectional area, stair riser height and fraction set).

### **[Conv] [ + ]**

*Pi ( $\pi$ )* — Constant = 3.141593.

### **[Conv] [ – ]**

*Positive/Negative Toggle* — Toggles the sign of the displayed value between positive and negative.

### **[Conv] [ • ]**

*Per* — Allows you to compute a total material cost given a unit dimension and an entered Per Unit Cost.

# OPERATING BASICS

## Linear Dimensions

To enter dimensional values, enter the largest dimension first – feet before inches, inches before fractions. Enter fractions by entering the numerator (value above the line), pressing [ / ] and then the denominator (value below the line).

**Note:** *If no denominator is entered, the default fraction setting is used. The examples below show how to enter linear dimensions:*

Dimension	Keystrokes
5 ft	5 [Feet]
1/2 in	1 [ / ] 2
5 ft 1 in	5 [Feet] 1 [Inch]
5 ft 1-1/2 in	5 [Feet] 1 [Inch] 1 [ / ] 2
10 yds	10 [Yds]
17.5 m	17.5 [m]

**Note:** *Yards, meters and millimeters may only be entered as whole values (5 yards) or decimal values (5.5 meters), and not in combination with feet and inches or themselves (5 meters, 8 millimeters). If a problem contains such a dimension, convert the yards (or meters) to “feet-inches” then add dimensions.*

# Square and Cubic Dimensions

---

Square and cubic dimensions are entered in the following order:

- 1) Numerical Value
- 2) Convention – Square or Cubic
- 3) Unit – Meters, Yards, Feet, Inches

**Note:** Feet-Inch format cannot be used to directly enter square or cubic values. By definition, this display format is a linear measurement. However, the area or volume can be found through simple multiplication.

The following examples show how to enter square and cubic dimensions:

<b>Dimensions</b>	<b>Keystroke</b>
5 Cubic Yards	5 [Cu] [Yds]
130 Square Feet	130 [Sq] [Feet]
33 Square Meters	33 [Sq] [m]



# Dimension Conversions

---

## Linear Conversions

---

Convert 14 feet to other linear dimensions:

Keystrokes	Display
14 [Feet] . . .	
[Conv] [Yds]	4.666667 YD
[Conv] [Feet]	14 FT 0 IN
[Conv] [Inch]	168 IN
[Conv] [mm]	4267.2 MM
[Conv] [m]	4.2672 M

## Square Conversions

---

Convert 14 square feet to other square dimensions:

Keystrokes	Display
14 [Sq] [Feet] . . .	
[Conv] [Inch]	2016 SQ IN
[Yds]	1.555556 SQ YD
[m]	1.300643 SQ M

**Note:** When converting values, [Conv] only has to be pressed once.

## Cubic Conversions

---

Convert 14 cubic feet to other cubic dimensions:

Keystrokes	Display
14 [Cu] [Feet] . . .	
[Conv] [Inch]	<b>24192 CU IN</b>
[Yds]	<b>0.518519 CU YD</b>
[m]	<b>0.396436 CU M</b>

**Note:** In the last conversion to “mm” the answer displays as “meters.” This will occur whenever the answer is beyond the calculator’s normal 7-digit range.

## Weight Conversions

---

Convert 25 tons to other weights:

Keystrokes	Display
25 [Weight] . . .	
[Conv] [Weight]	<b>50000 LB</b>
[Weight]	<b>22679.62 kG</b>
[Weight]	<b>25 Ton</b>

## ***Weight per Volume Conversions***

---

Your calculator has the capability of converting between weight and volume. The weight/volume ratio is permanently stored by entering the value and pressing **[Conv] [%]**. The default value is 1.5 tons per cubic yard.

Find the weight of 15 cubic yards at 1.75 tons per cubic yard, then convert to other weights:

<b>Keystrokes</b>	<b>Display</b>
1.75 [Conv] [%]	<b>1.75 Ton Per CU YD</b>
15 [Cu] [Yds] . . .	
[Conv] [Weight]	<b>26.25 Ton</b>
[Weight]	<b>52500 LB</b>
[Weight]	<b>23813.61 kG</b>
[Weight]	<b>26.25 Ton</b>

## Math Operations

---

Your calculator uses standard chaining logic. This means that you enter your first value, the operator (+, −, x, ÷), the second value, then the (=) sign.

3	[+]	2	[=]	5
3	[-]	2	[=]	1
3	[x]	2	[=]	6
3	[÷]	2	[=]	1.5

This feature also makes it easier to solve dimensional problems.

## Adding Dimensions

---

*Add 7 feet 3-1/2 inches to 11 feet 4 inches:*

7 [Feet] 3 [Inch] 1[/] 2 [+]  
11 [Feet] 4 [Inch] [=]      **18 FT 7-1/2 IN**

*Add 11 inches to 2 feet 1 inch:*

11 [Inch] [+] 2 [Feet] 1 [Inch] [=]      **36 IN**

*Add 2 feet 1 inch to 11 inches:*

2 [Feet] 1 [Inch] [+]  
11 [Inch] [=]      **3 FT 0 IN**

**Note:** The format of the first value you enter determines the format of the answer. However, with the [Conv] key, you can change to any format you want, provided that you maintain convention.

## ***Subtracting Dimensions***

---

*Subtract 3 feet from 11 feet 7-1/2 inches:*

11 [Feet] 7 [Inch] 1 [/] 2

[-] 3 [Feet] [=] **8 FT 7-1/2 IN**

*Subtract 32 inches from 81 inches:*

81 [Inch] [-] 32 [Inch] [=] **49 IN**

## ***Multiplying Dimensions***

---

*Multiply 5 feet 3 inches by 11 feet 6-1/2 inches:*

5 [Feet] 3 [Inch] [x]

11 [Feet] 6 [Inch] 1 [/] 2

[=] **60.59375 SQ FT**

*Multiply 2 feet 7 inches by 10 :*

2 [Feet] 7 [Inch] [x] 10 [=] **25 FT 10 IN**

## ***Dividing Dimensions***

---

*Divide 30 feet 4 inches by 7 inches:*

30 [Feet] 4 [Inch] [÷] 7 [Inch] [=] **52.**

*Divide 20 feet 3 inches by 9:*

20 [Feet] 3 [Inch] [÷] 9 [=] **2 FT 3 IN**

## Percentage Calculations

---

The Percent [%] key is used to find a percent of a number or for working add-on, discount or division percentages. It can be used with any type of number, any dimension (feet, inch, millimeter, etc.) and convention (non-dimensioned, linear, square or cubic).

*Find 18% of 500 feet:*

500 [Feet] [x] 18 [%]                      **90 FT 0 IN**

*Add 10% for waste to 137 square feet:*

137 [Sq] [Feet] [+] 10 [%]              **150.7 SQ FT**

*Take 20% away from 552 feet 6 inches:*

552 [Feet] 6 [Inch]

[-] 20 [%]                                      **442 FT 0 IN**

*Divide 350 cubic yards by 80%:*

350 [Cu] [Yds] [÷] 80 [%]              **437.5 CU YD**

## Memory Operation

---

Whenever using the Memory Function, the following keys enable you to add, subtract, and recall values stored in memory:

**[M+]** adds the displayed value to Memory.

**[Conv] [M+]** subtracts the displayed value from Memory.







**[Rcl] [M+]** recalls and displays the total value of the Memory.

**[Rcl] [Rcl]** displays and clears the Memory as does turning off your calculator.



**[Conv] [Rcl]** clears the value in Memory without disturbing the existing display value. Often used to replace the Memory value (**[Conv] [Rcl] [M+]**).

The Memory can be used with any format as long as values have the same convention.

## How to Use the Memory Function

Keystrokes	Display
1. 355 [M+]	355. 
[Rcl] [Rcl]	355.
2. 355 [M+]	355. 
255 [M+]	255. 
745 [Conv] [M+]	745. 
[Rcl] [Rcl]	– 135.
3. 10 [Feet] 5 [Inch]	
[M+]	10 FT 5 IN 
5 [Feet] 3 [Inch]	
1 [/] 16 [M+]	5 FT 3-1/16 IN 
[Rcl] [Rcl]	15 FT 8-1/16 IN

*You can also use [Conv] [Rcl] [M+] to replace any value in Memory with your current displayed value.*

4. 355 [M+]	355. 
500 [Conv] [Rcl] [M+]	500. 
[Rcl] [Rcl]	500.



## Fractional Settings

---

When *ConcreteCalc* is set to its default state, it rounds fractional values to the nearest 1/16 of an inch. However, you may program your preference for six different accuracy levels and two different modes (Normal and Fixed), all of which remain in permanent memory until revised or reset.

The fractional level can be revised by using the keystrokes below:

Keystroke	Fraction Setting
[Conv] 1	1/ <u>16</u>
[Conv] 2	1/ <u>2</u>
[Conv] 3	1/ <u>32</u>
[Conv] 4	1/ <u>4</u>
[Conv] 6	1/ <u>64</u>
[Conv] 8	1/ <u>8</u>

**Note:** Whenever the calculator is set to anything other than 1/16 normal mode, a star (★) will appear in the bottom left of the display during power up to indicate a special fractional setting has been stored within. The fractional setting can be displayed at any time by pressing [Rcl] [/].

## ***Normal Fractional Mode***

---

The default, *Normal Mode* (**[Conv] 7**), reduces a fraction to its lowest common denominator (for example,  $8/16$  rounds to  $1/2$ ). If a fraction is entered having a higher fractional accuracy than the current setting, the setting will be temporarily revised to the level of accuracy of the entered value.

## ***Fixed Fractional Mode***

---

In the *Fixed Mode* (**[Conv] 9**), fractional results are displayed in the set fractional value, not reduced. Entries of higher accuracy values will be rounded to the nearest fraction of the accuracy setting (for example, for a fraction level setting of  $1/16$ , an entry of  $5 \text{ [/]} 32 \text{ [=]}$  will result in a display of  $3/16$ ).

## ***Flashing Denominator***

---

Your calculator can be set to flash the denominator (bottom) when entering fractions by pressing **[Conv] [/]**. In this way, you can see what fractional accuracy level is set. Pressing **[Conv] [/]** again will turn the flashing denominator off. This is a permanent setting that will remain until revised or reset.

## Paperless Tape Function

---

The Paperless Tape allows you to review the last 20 entries of a calculation. To access this function, press **[Rcl] [=]**.

To review entered values, press **[Rcl] [=]** to access the tape mode and then press the **[+]** or **[-]** keys to either scroll forward or backward through the entries.

While in the paperless tape mode, the display will show the entered or calculated value, along with the sequence number of entry (e.g., 01, 02, 03, etc.) and the math operator (+, -, x, ÷, %) in the upper left corner of the display.

If an equals (**[=]**) has been used in the middle of a string and then added to, the letters **SUB** (Subtotal) will display in the upper left. If equals (**[=]**) was the last operation performed, the display will show **TTL** (Total) as the last entry.

To exit the paperless tape mode, press any key besides **[Off]**, **[+]**, **[-]**. Exiting the tape will display the last entry (or **TTL**), and allow you to either exit completely, or continue using the last tape value for another operation. For example, to store the last value as “Length”, press any key besides **[Off]**, **[+]** or **[-]** and then press **[=] [Length]**.

**Important:** To clear the paperless tape press **[On/C]** twice, or press off.

## **Previewing Paperless Tape**

---

1. Enter a string of numbers:

4 [Feet] [+]                      4 FT 0 IN

5 [Feet] [+]                      9 FT 0 IN

6 [Feet] [+]                      15 FT 0 IN

7 [Feet] [=]                      22 FT 0 IN

2. Access the Tape function:

[Rcl] [=]                      TTL = 22 FT 0 IN

3. Scroll from first value to total:

[+]                      01      4 FT 0 IN

[+]                      02+    5 FT 0 IN

[+]                      03+    6 FT 0 IN

[+]                      04+    7 FT 0 IN

[+]                      TTL = 22 FT 0 IN

4. Scroll to last 2 values:

[-]                      04+    7 FT 0 IN

[-]                      03+    6 FT 0 IN

5. Exit Tape function and add more:

[=]                      TTL = 22 FT 0 IN

*(press any key besides [Off], [+] or [-].)*

[+]                      22 FT 0 IN

2 [Feet] [=]                      24 FT 0 IN

# USING THE CONCRETECALC

## Linear Division

---

### *Spacing Calculation*

---

You want to divide a length of 170 feet 8-1/2 inches into 5 concrete slabs (of equal length). What is the length of each slab?

<b>Steps/Keystrokes</b>	<b>Display</b>
1. Clear calculator: [On/C] [On/C]	0.
2. Enter overall length: 170 [Feet] 8 [Inch] 1 [/] 2	170 FT 8-1/2 IN
3. Divide by number of equal spaces: [÷] 5 [=]	34 FT 1-11/16 IN

## **Segment Calculation**

You have a 78 feet 6 inch length of wall which you want to divide into five equal spaces for office partitioning. What is the length of each section?

<b><u>Steps/Keystrokes</u></b>	<b><u>Display</u></b>
--------------------------------	-----------------------

1. Clear calculator:

[On/C] [On/C]	0.
---------------	----

2. Enter overall length:

78 [Feet] 6 [Inch]	78 FT 6 IN
--------------------	------------

3. Divide by number of equal spaces:

[÷] 5 [=]	15 FT 8-3/8 IN
-----------	----------------

4. Convert to decimal feet then decimal inches:

[Conv] [Feet]	15.7 FT
---------------	---------

[Conv] [Inch]	188.4 IN
---------------	----------

# Linear Addition

---

## ***Building Perimeter***

---

You are measuring a building perimeter with the following measurements: 32 feet, 25 feet 5-1/2 inches, 19 feet, 5 feet 6-1/2 inches, 13 feet, and 31 feet. What is the total perimeter?

<b>Step/Keystrokes</b>	<b>Display</b>
1. Clear calculator: [On/C] [On/C]	0.
2. Add sides to find perimeter: 32 [Feet] [+]	32 FT 0 IN
25 [Feet] 5 [Inch] 1 [/] 2 [+]	57 FT 5-1/2 IN
19 [Feet] [+]	76 FT 5-1/2 IN
5 [Feet] 6 [Inch] 1 [/] 2 [+]	82 FT 0 IN
13 [Feet] [+]	95 FT 0 IN
31 [Feet] [=]	126 FT 0 IN

# Circle Calculations

---

## Circumference and Area

---

Find the circumference and area of a circle having a diameter of 10 inches.

Step/Keystrokes	Display
1. Clear calculator and enter diameter: [On/C] [On/C]	0.
10 [Inch] [Circ]	10 IN DIA
2. Find circle area and circumference: [Circ]	78.53982 SQ IN
[Circ]	31-7/16 IN CIRC
3. Convert to decimal inch: [Inch]	31.41593 IN

## Arc Lengths

---

Find the arc length of an 85° portion of a circle with a 5 foot diameter.

Step/Keystroke	Display
1. Clear calculator and enter diameter: [On/C] [On/C]	0.
5 [Feet] [Circ]	5 FT 0 IN DIA
2. Enter arc angle then find arc length: 85 [Conv] [Circ]	3 FT 8-1/2 IN ARC
3. Convert to decimal feet: [Feet]	3.708825 FT



## **Area Calculations**

---

### ***Area of a Rectangle***

---

What is the area of a room measuring 12 feet 6 inches by 15 feet 8 inches?

<b>Step/Keystrokes</b>	<b>Display</b>
1. Clear calculator: [On/C] [On/C]	0.
2. Enter length and width: 12 [Feet] 6 [Inch] [Length] 15 [Feet] 8 [Inch] [Width]	12 FT 6 IN 15 FT 8 IN
3. Find Area: [Conv] [Vol]	195.8333 SQ FT

### ***Area of a Square***

---

Using the  $x^2$  ([Conv] [ $\sqrt{\phantom{x}}$ ]) function, find the area of a square with sides of 4 feet 7 inches.

<b>Step/Keystrokes</b>	<b>Display</b>
1. Clear calculator: [On/C] [On/C]	0.
2. Enter length of side and find area: 4 [Feet] 7 [Inch] [Conv] [ $\sqrt{\phantom{x}}$ ]	21.00694 SQ FT

# Volume Calculations

---

## Volume of Concrete Slabs

---

What is the volume (in cubic yards) of a concrete slab 16 feet x 23 feet 5-3/4 inches x 4 inches? If you are pouring 5 slabs of the same dimension, what is the total volume of concrete required? Add 5% waste. After finding total cubic yards, convert to cubic meters.

Step/Keystrokes	Display
-----------------	---------

---

1. Clear calculator:

[On/C] [On/C]	0.
---------------	----

2. Enter length, width and depth, then find volume:

16 [Feet] [Length]

23 [Feet] 5 [Inch] 3 [/] 4 [Width]

4 [Inch] [Height]

[Vol]	4.63786 CU YD
-------	---------------

3. Multiply by 5:

[x] 5 [=]	23.1893 CU YD
-----------	---------------

4. Add 5 % waste:

[+] 5 [%]	24.34877 CU YD
-----------	----------------

5. Convert to cubic meters:

[m]	18.61597 CU M
-----	---------------

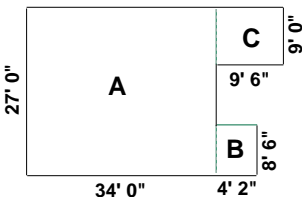
## **Volume of a Semicircular Pad**

You want to calculate the volume of a semi-circular pad with a diameter of 16 feet and a thickness of 4 inches. (Use the **[Circ]** key to find circle area).

<b>Step/Keystrokes</b>	<b>Display</b>
1. Clear calculator: [On/C] [On/C]	0.
2. Enter diameter: 16 [Feet]	16 FT
3. Find circle area: [Circ] [Circ]	201.0619 SQ FT
4. Divide by 2 for semi-circle: [÷] 2 [=]	100.531 SQ FT
5. Multiply by thickness to find cubic feet: [x] 4 [Inch] [=]	33.51032 CU FT
6. Convert to cubic yards: [Conv] [Yds]	1.241123 CU YD

## Complex Concrete Volume

You're going to pour an odd-shaped patio  $4\text{-}1/2$  inches deep with the dimensions as shown. First, calculate the total area (by dividing the drawing into three individual rectangles) and then determine the total cubic yards of concrete required for this job. What is the total cost of the concrete if it is selling for \$55 per cubic yard?



Step/Keystrokes	Display
1. Clear calculator: [On/C] [On/C]	0.
2. Find area "A" and add to Memory: 34 [Feet] [Length] 27 [Feet] [Width] [Conv] [Vol] [M+]	34 FT 27 FT 918 SQ FT
3. Find area "B" and add to Memory: 36 – ConcreteCalc™	

4 [Feet] 2 [Inch] [Length]

8 [Feet] 6 [Inch] [Width]

[Conv] [Vol] **35.41667 SQ FT**

[M+]

4. Find area "C" and add to Memory:

9 [Feet] [Length]

9 [Feet] 6 [Inch] [Width]

[Conv] [Vol] **85.5 SQ FT**

[M+]

5. Find Total Area/Volume and cost:

[Rcl] [Rcl] **1038.917 SQ FT**

[x] 4 [Inch] 1 [/] 2 [=]

**389.5937 CU FT**

[Conv] [Yds] **14.4294 CU YD**

[x] 55 [Conv] [•] **\$ 793.62**

## Concrete Columns

---

You're going to pour five columns, each with a diameter of 3 feet 4-1/2 inches and a height of 11 feet 6 inches. How many cubic yards of concrete are needed for all five columns? If the concrete weighs 1.75 tons per cubic yard, what is the total weight in tons? In pounds? In kilograms?

Step/Keystrokes	Display
-----------------	---------

---

- |                      |    |
|----------------------|----|
| 1. Clear calculator: |    |
| [On/C] [On/C]        | 0. |

### *Find Cross-sectional Area of Column*

- |  |                |
|--|----------------|
| 2. Enter diameter and find surface area: |                |
| 3 [Feet] 4 [Inch]                        | 3 FT 4- 1.2 IN |
| 1 [/] 2 [Circ] [Circ]                    | 8.946176 SQ FT |

### *Find Volume*

- |   |                |
|---|----------------|
| 3. Multiply by height and convert to cubic yards: |                |
| [x] 11 [Feet]                                     |                |
| 6 [Inch] [=]                                      | 102.881 CU FT  |
| [Conv] [Yds]                                      | 3.810408 CU YD |
| 4. Multiply by 5 columns and enter into Memory:   |                |
| [x] 5 [=]   | 19.05204 CU YD |
| [M+]  |                |

### *Find Total Weight*

5. Enter weight in tons per cubic yards:

1.75 [Conv] [%]    **1.75 Ton Per CU YD**

6. Recall Memory and find weights:

[Rcl] [Rcl]                    **19.05204 CU YD**

[Conv] [Weight]                **33.34107 TON**

[Weight]                         **66682.14 LB**

[Weight]                         **30246.52 KG**

## ***Volume of Driveway***

---

You need to calculate the cubic yards of concrete required for pouring a driveway. The measurements are as follows: 36 feet 3 inches deep. What's the volume of the driveway? If concrete costs \$47 per cubic yard, how much will the driveway cost?

<b><i>Step/Keystrokes</i></b>	<b><i>Display</i></b>
-------------------------------	-----------------------

---

1. 1. Clear calculator:

[On/C] [On/C]

0.

***Find Volume***

2. Enter length, width, depth:

36 [Feet] 3 [Inch] [Length]

11 [Feet] 6 [Inch] [Width]

4 [Inch] 3 [/] [Height]

3. Find volume in cubic yards.

[Vol]

**6.111593 CU YD**

***Multiply by Cost***

4. Multiply by price per cubic yard to find total cost:

[x] 47 [Conv] [•]

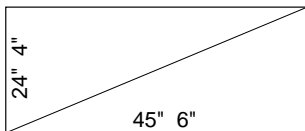
**\$2876.24**



## **"Square-up" Concrete**

### **Squaring a Concrete Slab**

Assume you want to "Square-up" the forms for a concrete foundation measuring 45 feet 6 inches by 24 feet 4 inches. To square the forms, find the square-up (diagonal) length. If the slab is 4 inches thick, find the area and volume.



<b>Step/Keystrokes</b>	<b>Display</b>
------------------------	----------------

1. Clear calculator:

[On/C] [On/C]	0.
---------------	----

2. Enter length, width and solve for square-up:

45 [Feet] 6 [Inch] [Length]	
-----------------------------	--

24 [Feet] 4 [Inch] [Width]	
----------------------------	--

[Sq-Up]	51 FT 7-3/16 IN
---------	-----------------

3. Solve for area and volume:

[Conv] [Vol]	1107.167 SQ FT
--------------	----------------

4 [Inch] [Height]	4 IN
-------------------	------

[Vol]	13.66872 CU YD
-------	----------------

# **Blocks, Bricks, Walls & Footings**

## **Computing Number of Blocks**

You are building an “L” shaped retaining wall out of standard 8 inch x 16 inch blocks. One side of the retaining wall is 22 feet long, and the other side is 15 feet 8 inches long. The wall is to be 4 feet high. How many blocks are required to build this wall?

<b>Step/Keystrokes</b>	<b>Display</b>
1. Clear calculator: [On/C] [On/C]	0.
2. Enter block size: 8 [Inch] [x] 16 [Inch] [=] [Conv] [Block]	128 SQ IN
3. Enter total wall length: 22 [Feet] [+] 15 [Feet] 8 [Inch] [=] [Length]	37 FT 8 IN
4. Enter height: 4 [Feet] [Height]	4 FT
5. Find number of blocks and add 5% waste: [Block]	169.5 (170 Blocks)
[+] 5 [%]	177.975 (178 Blocks)

## **Masonry — Estimating Bricks**

How many standard bricks (2-1/4- x 8-inch) are needed for a wall measuring 36 feet 6 inches long and 8 feet high?

<b>Step/Keystrokes</b>	<b>Display</b>
1. Clear calculator: [On/C] [On/C]	<b>0.</b>
2. Enter brick area: 2 [Inch] 1 [/] 4 [x] 8 [Inch] [=] [Conv] [Block]	<b>18 SQ IN</b>
3. Enter wall length and height: 36 [Feet] 6 [Inch] [Length] 8 [Feet] [Height]	<b>36 FT 6 IN</b> <b>8 FT</b>
4. Find number of bricks and add 5% for spoilage: [Block]	<b>2336 (Bricks)</b>
[+] 5 [%]	<b>2452.8 (2453 Bricks)</b>

## **Wall Volume (Using Footing Key)**

What is the concrete volume of a wall 12 feet high x 8 inches thick, that measures 35 feet 6 inches in length?

<b>Step/Keystrokes</b>	<b>Display</b>
------------------------	----------------

1. Clear calculator: [On/C] [On/C]	0.
---------------------------------------	----

2. Enter wall cross-sectional area: 12 [Feet] [x] 8 [Inch] [=] [Conv] [Ftg]	8 SQ FT
---	---------

3. Enter wall length and find cubic yards: 35 [Feet] 6 [Inch] [Ftg] [Conv] [Yds]	284 CU FT 10.51852 CU YD
--	-----------------------------

## **Concrete Footing**

Find the number of cubic yards of concrete required for a (16 inch x 8 inch) footing that measures 232 feet 6 inches in length.

<b>Step/Keystrokes</b>	<b>Display</b>
------------------------	----------------

1. Clear calculator: [On/C] [On/C]	0.
---------------------------------------	----

2. Enter footing area: 8 [Inch] [x] 16 [Inch] [=] [Conv] [Ftg]	128 SQ IN
--	-----------



## ***Concrete Footings — Continuous Lengths***

---

You are going to pour concrete for a 1 foot 4 inch x 8 inch footing being used for the following continuous lengths of footing: 15 feet, 18 feet, 24 feet and 33 feet. What is the total volume of concrete you'll need?

<b>Step/Keystrokes</b>	<b>Display</b>
1. Clear calculator: [On/C] [On/C]	0.
2. Enter footing area: 1 [Feet] 4 [Inch] [x] 8 [Inch] [=] [Conv] [Ftg]	0.888889 SQ FT
3. Add lengths: 15 [+] 18 [+] 24 [+] 33 [=] [Feet]	90 FT
4. Find total volume: [Ftg]	80 CU FT
5. Convert to yards: [Conv] [Yds]	2.962963 CU YD

## **Tilt-Up Walls (Volume & Weight)**

Find the total volume and weight of a 10 foot high by 16 foot long by 8 inch thick concrete tilt-up wall. The unit weight is 1.5 tons per cubic yard of concrete.

<b>Step/Keystrokes</b>	<b>Display</b>
------------------------	----------------

1. Clear calculator:

[On/C] [On/C]	0.
---------------	----

*Enter the Unit Weight of Concrete*

2. Enter unit weight:

1.5 [Conv] [%]	1.5 Ton Per CU YD
----------------	-------------------

*Find Wall Volume*

3. Enter height, length and thickness:

10 [Feet] [Height]	10 FT
--------------------	-------

16 [Feet] [Length]	16 FT
--------------------	-------

8 [Inch] [Width] (as Width)	8 IN
-----------------------------	------

4. Solve for volume:

[Vol]	3.950617 CU YD
-------	----------------

*Find the Total Wall Weight*

5. Find weight:

[Conv] [Weight]	5.925926 Ton
-----------------	--------------

**Note:** Weight may come up in either kgs, Pounds or Tons depending on last display value. Continued pressing of Weight key will toggle through all values.

## Computing Drop

### Drop of Sloped Patio

You're pouring a sloped concrete patio with a length of 14 feet. If the standard drop or fall is 1/8 inch per foot, what is the total drop or fall? What if the drop is 1/4 inch per foot or .375 inch per foot?

<u>Step/Keystrokes</u>	<u>Display</u>
1. Clear calculator: [On/C] [On/C]	0.
2. Enter total length of wall: 14 [Feet] [Length]	14 FT
3. Enter 1/8 inch drop per foot and find amount of drop: 1[/] 8 [Drop]	0 FT 1-3/4 IN
4. Enter 1/4 inch drop per foot and find amount of drop: 1[/] 4 [Drop]	0 FT 3-1/2 IN
5. Enter .375 inch drop per foot and find amount of drop: .375 [Inch] [Drop]	.4375 FT
6. Convert to decimal inches: [Conv] [Inch]	5.25 IN
7. Convert to inch-fraction: [Inch]	5-1/4 IN



## **Drop of Retaining Wall**

You're building a 61 foot 8 inch retaining wall along a driveway that slopes away at 1/4 inch per foot. There are 4 sections, each measuring 15 feet 5 inches in length. What is the proper drop amount for each section? What is the total (accumulated) drop depth at the end of all four sections?

<b>Step/Keystrokes</b>	<b>Display</b>
1. Clear calculator: [On/C] [On/C]	0.
2. Enter wall section length: 15 [Feet] 5 [Inch] [Length]	15 FT 5 IN
3. Enter drop per foot to find the drop per section & the total drop depth at 1st wall section: 1 [/] 4 [Drop]	0 FT 3-7/8 IN
4. Find total drop depth of 2nd through 4th wall sections: [Drop] [Drop] [Drop]	0 FT 7-11/16 IN 0 FT 11-9/16 IN 1 FT 3-7/16 IN

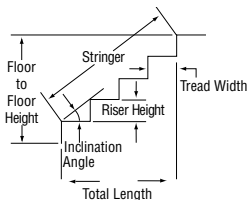
**Note:** Successive presses of [Drop] will continue to add the drop amount of 3-7/8 inches to the prior wall section's drop, for an accumulated drop total.

## Stair Problems (Risers/Treads)

The *ConcreteCalc* can compute the values used in stair building. Given values for total Height, Run or Length and a “Desired Stair Riser Height,” *ConcreteCalc* can find these values. To display them, repeatedly press [Stair] the number of times indicated in the following table.

# Press	Value
1	Number of Risers
2	Riser Height
3	Underage/Overage for Risers
4	Number of Treads
5	Tread Width
6	Underage/Overage for Treads
7	Stringer (Carriage) Length
8	Inclination Angle

**Note:** The default “Desired Stair Riser Height” is 7-1/2 inches. This can be revised by entering the new height and pressing [Stair] (e.g., 8 [Inch] [Stair]).



## **Risers Only — Custom Height**

You're building an access stairway with unconventional height risers. If the total rise is 3 feet 8-3/4 inches and the desired riser height is 5-1/2 inches, find the number of stair risers, actual riser height, and any overage/underage.

<b><u>Step/Keystroke</u></b>	<b><u>Display</u></b>
1. Clear calculator: [On/C] [On/C]	0.
2. Enter Rise (Height): 3 [Feet] 8 [Inch] 3 [/] 4 [Height]	
3. Enter 5-1/2" Riser: 5.5 [Stair]	5-1/2 IN R-HT
4. Find # of Risers: [Stair]	8 RSRS
5. Find actual Riser height: [Stair]	5-9/16 IN R-SZ
6. Find Under/Overage: [Stair]	- 0-1/4 IN R+/-
7. Reset calculator: [Conv] [x]	0.

## **Risers & Treads – 7-1/2" Riser Height**

You're building a stairway with a floor to floor height of 28 feet 5-1/2 inches, a length of 35 feet 6 inches and a nominal riser height of 7-1/2 inches (default). Find the number of risers, riser height, underage/overage, number of treads, tread width and underage/overage, stringer length and inclination angle.

<b>Step/Keystrokes</b>	<b>Display</b>
1. Reset calculator: [Conv] [x]	0.
2. Enter Rise and Run: 28 [Feet] 5 [Inch] 1 [/] 2 [Height] 35 [Feet] 6 [Inch] [Length]	
3. Enter Desired Riser Height: 7 [Inch] 1 [/] 2 [Stair]	7-1/2 IN R-HT
4. Find Number of Risers: [Stair]	46 RSRs
5. Find Actual Riser Height: [Stair]	7-7/16 IN R-SZ
6. Find Underage/Overage: [Stair]	0-5/8 IN R+/-

7. Find Number of Treads  
[Stair] **45 TRDS**
8. Find Tread Width  
7 [Stair] **9-7/16 IN T-SZ**
9. Find Underage/Overage  
[Stair] **-1-5/16 IN T+/-**
10. Find Stringer Length  
[Stair] **45 FT 1-3/8 IN STRG**
11. Find Inclination Angle  
[Stair] **38.10298 INC°**

## APPENDIX A

**Accuracy/Display** Your calculator has an eleven digit display. This is made up of seven digits (normal display) and four digits for the fraction. In a standard calculation, each calculation is carried out internally to 10 digits and rounded to a 7-digit standard display. If the next undisplayed digit is five or more, the 5/4 rounding technique adds 1 to the least significant digit in the display. If the digit is less than five, no rounding occurs.

**“Error”** When an incorrect entry is made, or an answer is beyond the calculator’s range, the word “Error” displays. To clear an error you must hit the **[On/C]** key twice. When you have determined what caused the error, re-key the problem. An “Error” will also occur if you enter a mathematical impossibility such as division by zero.

**Auto-Range** If an “overflow” occurs due to an input or calculation that use more digits than the display’s standard 7-digit range, the answer automatically displays in the next larger unit (instead of showing “Error”). i.e., *10,000,000 mm* is greater than the 7-digit range; therefore, *10,000 m* is displayed instead. This auto-

ranging also applies to other dimensional units such as inches to feet, feet to yards, etc.

**Battery & Auto Shut-Off** Your calculator is powered by a single 3-Volt Lithium CR-2032 battery. This should last approximately 800 hours of actual use (1 year plus for most people). Should the display become very dim or erratic, replace the battery. **Warning!** *Please use caution when disposing of your old batteries as they contain hazardous chemicals.*

Your calculator is designed to shut itself off after about 8-12 minutes of non-use.

**Note:** *Values in Memory or shown on the display will be cleared.*

**Full Reset/All Clear** Press [**Conv**] [**x**] to clear all memory registers. After a Full Reset/All-Clear, the following settings return to their default state:

## Default Settings

Setting	Default
Weight per Volume	1.5 Tons/Cu. Yd.
Block Area	128 Sq. Inch
Footing X-Area	1.8 Sq. Feet
Stair Riser Height	7-1/2 Inch
Fractional Setting	1/16
Fractional Mode	Normal

## Surface Area & Volume Formulas

---



### Cube

$$\text{Surface area} = 6a^2$$

$$\text{Volume} = a^3$$



### Rectangle Prism

$$\text{Surface area} = 2hw + 2hl + 2lw$$

$$\text{Volume} = l \times w \times h$$



### Cone

$$\text{Surface area} = \pi r \sqrt{r^2 + h^2}$$

(+  $\pi r^2$  if you add the base)

$$\text{Volume} = \frac{\pi r^2}{3} h$$



### Sphere

$$\text{Surface area} = 4 \pi r^2$$

$$\text{Volume} = \frac{4}{3} \pi r^3$$



### Cylinder

$$\text{Surface area} = 2\pi r h + 2\pi r^2$$

$$\text{Volume} = \pi r^2 h$$



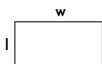
## Area Formulas

---



### Square

$$\text{Area} = a^2$$



### Rectangle

$$\text{Area} = lw$$



### Triangle

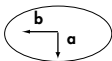
$$\text{Area} = \frac{1}{2} a b$$



### Circle

$$\text{Circumference} = 2 \pi r$$

$$\text{Area} = \pi r^2$$



### Ellipse

$$\text{Area} = \pi a b$$

## **WARRANTY REPAIR SERVICE — USA**

Calculated Industries, Inc. ("CII") warrants this product against defects in materials and workmanship for a period of one (1) year from the date of original consumer purchase in the U.S. If a defect exists during the warranty period, CII at its option will either repair (using new or remanufactured parts) or replace (with a new or remanufactured unit) the product at no charge.

**THE WARRANTY WILL NOT APPLY TO THE PRODUCT IF IT HAS BEEN DAMAGED BY MISUSE, ABUSE, ALTERATION, ACCIDENT, IMPROPER HANDLING OR OPERATION, OR IF UNAUTHORIZED REPAIRS ARE ATTEMPTED OR MADE. SOME EXAMPLES OF DAMAGES NOT COVERED BY WARRANTY INCLUDE, BUT ARE NOT LIMITED TO, BATTERY LEAKAGE, BENDING, OR VISIBLE CRACKING OF THE LCD WHICH ARE PRESUMED TO BE DAMAGES RESULTING FROM MISUSE OR ABUSE.**

To obtain warranty service in the U.S., ship the product postage paid to the CII Authorized Service Provider listed on the back page of the User's Guide. Please provide an explanation of the service requirement, your name, address, day phone number and dated proof of purchase (typically a sales receipt). If the product is over 90 days old, include payment of \$6.95 for return shipping and handling within

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If you have one, or if you have any suggestions for improvements to this product or its User's Guide, please call or write our Product Development Department. Thank you.

## Notes

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## ***How To Reach CII Headquarters***

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<http://www.calculated.com>

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